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ORIGINAL ARTICLE

Changes and predictors of adolescent emotion regulation, self-esteem, and locus of control during the COVID-19 pandemic: 2004 Pelotas Birth Cohort

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Objectives: There is growing interest in examining the impacts of the coronavirus disease 2019 (COVID-19) pandemic on adolescent socioemotional development. This study aimed to examine changes in adolescent emotion regulation (ER), self-esteem (SE), and locus of control (LoC) from before to during the pandemic in a Brazilian birth cohort, and to investigate the variables associated with changes in those socioemotional competences.
Methods: 1,949 adolescents from the 2004 Pelotas Birth Cohort were assessed before (T_1, November 2019 to March 2020) and during (T_2, August to December 2021) the COVID-19 pandemic (mean ages [SD] = 15.69 [0.19] and 17.41 [0.26], respectively). Adolescents' socioemotional competences were assessed, including ER, SE, and LoC. Sociodemographic, pre-pandemic, and pandemic-related correlates were examined as predictors of change. Multivariate latent change score models were used in the analyses.
Results: There were significant mean increases in adolescents' ER and SE (mean ER = 1.918, $p < 0.001$; mean SE = 1.561, $p = 0.001$) and a significant mean decrease (towards internalization) in LoC levels (MLoC = -0.497, $p < 0.01$) during the pandemic. Factors that predicted a lower competency increase included family conflicts, harsh parenting, and maternal depressive symptoms during the pandemic.
Conclusion: Despite the stress imposed by the COVID-19 pandemic, the adolescents of this cohort showed positive development in their socioemotional competences. Family-related factors emerged as important predictors of adolescent socioemotional adjustment during the study period.

Keywords: Adolescent; emotion regulation; socioemotional competences; COVID-19 pandemic; cohort

Introduction

In March 2020, the World Health Organization (WHO) declared the novel coronavirus disease 2019 (COVID-19) outbreak a global pandemic.[1] Soon afterwards, most countries started to implement strategies aiming to reduce infection, hospitalization, and mortality rates, such as nationwide lockdowns, mobility restrictions, and closure of non-essential commercial establishments.[1] As such, the health crisis led to a profound disruption in daily living, raising concerns about potential implications on the population's mental health and well-being, especially for vulnerable groups such as children and adolescents.[2]

The scientific community has endeavored to understand the magnitude of the effect of the COVID-19 pandemic on mental health and the factors associated with any potential changes.[3,4] There is substantial evidence of negative impacts of the pandemic on child and adolescent mental health.[3,4] A recent systematic review and an umbrella review showed substantial worsening of child and adolescent mental health problems during the pandemic, with increased levels of depression, anxiety, distress, and loneliness.[3,4] These increases in mental health problems were associated with several variables, including older age, female gender, disadvantaged socioeconomic position, baseline mental health conditions, and adverse family contexts, such as household dysfunction and child abuse.[3,4]

Despite this considerable evidence about the impacts of the pandemic on mental health conditions, less is

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known about its effects on other facets of the health spectrum, which includes socioemotional competences. As stated by WHO, health should not be considered as the mere absence of disease, and aspects such as mental and social well-being are fundamental elements of being healthy.[5] Investigating how the COVID-19 pandemic affects these psychological dimensions is imperative to fully describing its impacts.[6] Constructs such as emotion regulation (ER), self-esteem (SE), and locus of control (LoC) are associated with mental health resilience and serve as buffering factors against life stressors;[7] therefore, changes in these competencies during the pandemic may have lasting influences on mental health.

Adolescence is a unique developmental stage in which major changes in biological, cognitive, emotional, and social domains occur rapidly.[8] During this period, there is an expansion in social relationships, youth increasingly identify with peers, and seek social belonging and approval.[9] During the COVID-19 pandemic, adolescents spent considerable time confined at home interacting with their parents at an age when they are expected to socialize outside the family, which may have influenced their psychosocial development.[9] Therefore, to inform future efforts to support youth well-being, it is essential to investigate if and to what extent the pandemic altered socioemotional development during such a critical phase of the life cycle.[6]

The present study aimed to investigate longitudinal changes in ER, SE, and LoC among adolescents from a Brazilian birth cohort by using data from both immediately before and during the pandemic. In addition, we sought to explore the socioeconomic, family, and pandemic-related variables associated with changes in these socioemotional competences.

Methods

Sample and data collection

The present study used data from the 2004 Pelotas Birth Cohort, an ongoing, population-based birth cohort in Southern Brazil. Detailed information about its participants and procedures has been published elsewhere.[10,11] In 2004, we invited all mothers whose children were born in the city of Pelotas to participate, at which time 4,231 participants were assessed (response rate at recruitment $>$ 99%). In addition to the perinatal interview, follow-up interviews were conducted at participants' homes at mean ages (SD) of 3.0 (0.1), 11.9 (0.2), 23.9 (0.4), and 49.5 (1.7) months, and at a research clinic at 6.8 (0.3) and 11.0 (0.3) years of age. The seventh follow-up wave (mean age = 15.7, SD = 0.2) occurred between November 2019 and March 2020, stopping when social distancing measures were implemented in Brazil in response to the COVID-19 pandemic and data collection at the research clinic had to be interrupted. At that point, 1,949 adolescents and their caregivers had been interviewed (48.5% of the original cohort were invited to participate by birth order). Subsequently, amid one wave of the pandemic, we aimed to reassess the same subsample of 1,949 participants to investigate the impacts of COVID-19 on the same individuals by comparing outcomes from immediately before versus during the pandemic. This mid-pandemic assessment occurred in the participants' households, between August and December 2021, at which time a total of 1,826 adolescents (mean age = 17.4, SD = 0.2) and their caregivers (91.9% biological or adoptive mothers, 3.9% fathers, 1.9% grandparents, and 2.3% others) were interviewed in person. Considering that three deaths were identified between the 15-year follow-up and the COVID-19 follow-up, the 1,826 participants evaluated during the pandemic represent a retention rate of 93.8% since the previous wave. Figure S1, available as online-only supplementary material, shows a flow diagram of participation in the cohort over time.

Measures

Adolescent socioemotional competences

We assessed three socioemotional competences in adolescence both before and during the pandemic: ER, SE, and LoC.

ER was measured by the self-reported Portuguese version of the Emotional Regulation Index for Children and Adolescents (ERICA).[12] ERICA is a 16-item scale rated on a five-point Likert response format (from 1, Totally disagree, to 5, Totally agree), yielding sum scores ranging from 16-80 points. Ten of the 16 items were reverse-scored, such that higher scores reflect more adaptive or functional ER.

SE was measured by the self-reported Rosenberg Self-Esteem Scale (RSES), previously validated and translated into Portuguese.[13,14] The measure evaluates an individual's global SE, including six items referring to a positive self-evaluation (e.g., "I feel that I am a person of worth, at least on an equal plane with others.") and four items related to a self-deprecating view (e.g., "I certainly feel useless at times."). The self-deprecating items were reverse-scored. The 10 items are scored on a four-point Likert scale (from 1, Totally disagree, to 4, Totally agree) and the total score range from 10-40 was obtained by summing all items, with higher scores indicating higher levels of SE.

LoC was assessed using the Nowick-Strickland Internal-External Scale (NSIES).[15] The scale was translated into Portuguese and its psychometric properties were positively evaluated by Barros et al.[16] The measure consists of a 12-item test scored dichotomously (yes-no response format), with higher scores indicating a more external LoC (score range: 0-12). An internal LoC indicates that the person's perception of events and outcomes is under their control and choices, while a person with a more external LoC perceives that the outcome of events is the result of luck or random factors not under his or her power.

Sociodemographic and pre-pandemic variables (T_1)

The sociodemographic variables were assessed in the perinatal interview and included family income in the month before delivery (quintiles), maternal education (number of completed years of formal education), maternal self-reported skin color (white or black/brown),

marital status (mothers were asked if they were living with a partner; yes/no), and sex of the child (female or male).

Maternal or caregiver depressive symptoms were measured using the Edinburgh Postnatal Depression Scale (EPDS),[17,18] which assesses the intensity of depressive symptoms over the previous 7 days. The EPDS is a self-report, 10-item, four-point Likert scale (score range: 0-30), with higher scores indicating more severe depressive symptoms.

Mid-pandemic variables (T_2)

Harsh parenting was measured using the parent-report version of the Parent-Child Conflict Tactics Scale (CTSPC), specifically its psychological aggression (five items) and physical aggression (nine items).[19] Each item was rated on a five-point Likert scale and the harsh parenting score was derived by adding all responses (score range: 0-28). Higher scores indicate more frequent episodes of harsh parenting behavior during the preceding year. Maternal or caregiver depressive symptoms at T_2 were measured using the EPDS.[17,18]

Pandemic-related variables assessed at T_2 included: whether the family had applied for the pandemic-specific government cash transfer benefit (Programa Auxílio Emergencial, yes/no); maternal or caregiver job loss during the pandemic (yes/no); fear of food shortage (''Did you feel concerned/afraid of not having food during the pandemic?'', yes/no); perceived impact of the pandemic (''How much have you been affected by the pandemic and/or social distancing measures?'', with possible answers ''Not affected at all'', ''Affected a little'', ''Moderately affected'', and ''Affected a lot''); levels of social isolation (categorized as ''low/no social isolation'', ''moderate social isolation'', and ''strict social isolation''), fear of getting sick (''Were you afraid of getting COVID-19?'', yes/no), family conflicts (''During the lockdown, there were always fights and arguments in my family'', yes/no), and negative perception of screen time (''During the lockdown, I spent a lot of time on the tablet, computer and smartphone and this was not good for me'', yes/no).

Statistical analysis

To examine the changes in adolescents' socioemotional competences from the pre-pandemic (T_1) to the mid-pandemic (T_2) time points, we used a multivariate latent change score (LCS), a powerful and flexible class of structural equation model.[20-22] The differences in the indicators between T_1 and T_2 are modeled as a latent variable (i.e., an LCS factor), providing a robust estimator of the average change over time.[20,21] The variance of the change factor (σ^2) captures the extent to which the individuals differ in the change they manifest over time, and the proportional change refers to how much the change is dependent on the T_1 scores.[20-22]

In the present study, changes in ER, SE, and LoC scores were modeled in three parallel processes (Figure 1). The proportional change was evaluated by the inclusion of an autoregressive path from T_1 measures to the LCS factor. In the next step, we included the demographic and pre-pandemic variables to investigate the predictors of initial levels of adolescents' socioemotional competences and, additionally, the mid-pandemic variables to examine the predictors of the latent change factor. Unstandardized and standardized coefficients are shown. Adolescent age was included in all models to account for its possible effect on initial levels

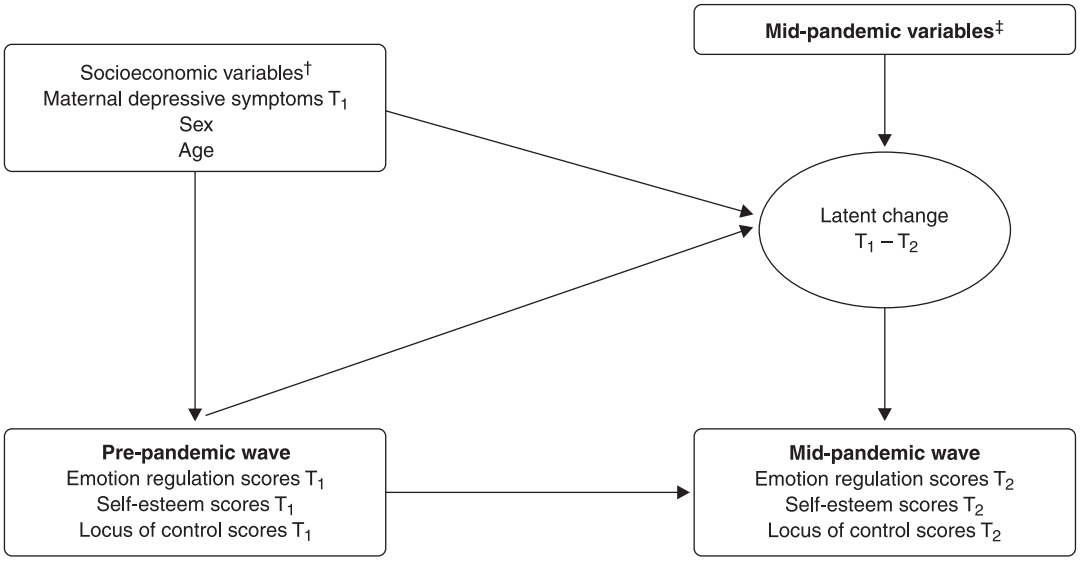

Figure 1 Latent change score (LCS) model for emotion regulation (ER), self-esteem (SE), and locus of control (LoC) scores from the pre-pandemic (T_1) to the mid-pandemic assessments (T_2). † Socioeconomic variables are maternal schooling, family income, maternal skin color, marital status. ‡ Mid-pandemic variables are maternal depressive symptoms at T_2, beneficiary of government pandemic-specific cash transfer program (Programa Auxílio Brasil), maternal job loss, harsh parenting, fear of food shortage, social isolation, perceived impacts of the pandemic, family conflicts, screentime.

and LCSs. The LCS was conducted in Mplus 8.4, using maximum likelihood estimation with robust standard errors (MLR) in all models.[21] Missingness is accounted for with full information maximum likelihood estimation (FIML), assuming responses are missing at random. We evaluated the goodness-of-fit of the LCS model using the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). Specifically, CFI/TLI $\geqslant$ 0.90, RMSEA $<$ 0.08, and SRMR $<$ 0.08 are considered indicative of a good fit.[20,22]

Ethics statement

All 2004 Pelotas Birth Cohort follow-ups were approved by the research ethics committee of Faculdade de Medicina, Universidade Federal de Pelotas. All principal caregivers and adolescents signed an informed consent form before data collection. The present study was also approved by the research ethics committee (Comissão de Ética para Análise de Projetos de Pesquisa, CAPPesq) of Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (research protocol 4.951.457).

Results

Descriptive statistics

The sociodemographic characteristics of the cohort participants who were either included or not included in the current study are shown in Table 1. Compared to the cohort members not included in the current study, the included sample is comprised of wealthier families, more educated mothers, and a higher percentage of mothers who were living with a partner at the time of delivery. There were no significant differences between the pre- and mid-pandemic samples regarding socioeconomic factors at a $p < 0.05$ level. Table S1, available as online-only supplementary material, shows the mean, SD, and correlations between the socioemotional competences at T_1 and T_2. All correlations were significant, ranging from very weak to moderate (-0.145 to 0.598).

Latent change scores (LCS) modeling

The model fit for the multivariate latent change model was excellent: χ^2 = 126.950, degrees of freedom (df) = 35, CFI/TLI = 0.976/0.915, RMSEA (90%CI) 0.025 (0.020-0.030), and SRMR = 0.021.

The mean of the latent change factor was positive and significant for ER (M_{slope} = 1.918, standard error [SE] = 0.145, $p < 0.001$) and SE (M_{slope} = 1.561, S.E. = 0.094, p = 0.001), indicating an increase in levels of these socioemotional competences from the pre- to the mid-pandemic assessments. The mean of the latent change factor for LoC was negative and significant (M_{slope} = -0.487, SE = 0.045, $p < 0.01$), meaning that the adolescents' LoC shifted towards being more internally focused across the study period. All coefficients for proportional change were significant and negative, showing that lower baseline scores of these measures were associated with larger latent changes from T_1 to T_2 (Table 2).

Table 1 Demographic characteristics of study participants

Variables	Cohort members not included in the study (n = 2,210)	T_1 (n = 2,021)	T_2 (n = 1,805)
Family income (quintiles)			
1st quintile (poorest)	497 (22.5)*	374 (18.5)	327 (18.1)
2nd to 5th quintile	1,713 (77.5)	1,647 (81.5)	1,478 (81.9)
Maternal schooling (years)			
0-4	373 (17.1)*	281 (14.0)	254 (14.2)
5-8	915 (42.0)	816 (40.7)	719 (40.1)
$\geqslant$ 9	892 (40.9)	909 (45.3)	818 (45.7)
Maternal skin color			
White	1,599 (72.4)	1,489 (73.7)	1,325 (73.4)
Non-white	609 (27.6)	532 (26.3)	480 (26.6)
Living with a partner at childbirth			
Yes	1,818 (82.3)*	1,718 (85.0)	1,533 (84.9)
No	390 (17.7)	303 (15.0)	272 (15.1)
Adolescent's sex			
Male	1,161 (52.5)	1,034 (51.2)	917 (50.8)
Female	1,049 (47.5)	987 (48.1)	888 (49.2)
Adolescent's age			
Mean (SD)	-	15.69 (0.2)	17.41 (0.3)
Range		15.01-16.15	16.7-17.9

Data presented as n (%), unless otherwise specified.
T_1 = pre-pandemic; T_2 = mid-pandemic.
* $p < 0.05$ for the difference between the pre-pandemic sample (T_1; n = 2,021) and the sample not included in the current study (n = 2,210). There were no statistically differences in socioeconomic variables between the pre-pandemic (T_1) and mid-pandemic (T_2) samples.

Table 2 LCS, individual variability, and proportional change in ER, SE, and LoC scores from T_1 to T_2

	LCS; T_1-T_2		Individual variance		Proportional change	
Score	M_{slope} (S.E.)	p-value	σ^2	p-value	β (S.E.)	p-value
ER	1.918 (0.145)	< 0.001	0.939	< 0.001	-0.437 (0.023)	< 0.001
SE	1.561 (0.094)	< 0.001	0.945	< 0.001	-0.438 (0.022)	< 0.001
LoC	-0.487 (0.045)	< 0.001	0.980	< 0.001	-0.573 (0.017)	< 0.001

ER = emotion regulation; LCS = latent change scores; LoC = locus of control; S.E. = standard error; SE = self-esteem.

Standardized coefficients are shown. Maximum likelihood robust estimator was used, with full maximum information likelihood for handling missing data. Latent change scores (LCS) show the mean increase or decrease of the scores between pre-pandemic (T_1) and mid-pandemic (T_2) assessment, modeled as a latent variable. Individual variance (σ^2) captures the extent to which individuals differ in the change they manifest over time. Proportional change shows the extent to which the LCS are related to pre-pandemic scores.

Table S2, available as online-only supplementary material, shows the correlation between the LCS factors. The correlation of the LCS factors for ER and SE is moderate and significant ($r = 0.404$, $p < 0.001$), and for ER and LoC is very weak but significant ($r = -0.072$, $p < 0.05$). The LCS factors of SE and LoC had a nonsignificant correlation ($r = -0.004$, $p > 0.05$) (Table S2). These results indicate that mean changes in different socioemotional competences between T_1 and T_2 are not strongly correlated with each other.

Table 3 (standardized coefficients) and Table S3 (unstandardized coefficients) show demographic and pre-pandemic predictors of T_1 scores and demographic, pre-pandemic, and mid-pandemic predictors of LCS s from T_1 to T_2. The predictors for higher ER and SE scores during the pre-pandemic assessment were higher family income, lower maternal depressive symptoms, and being a male adolescent. A greater internal LoC at T_1 was predicted by higher maternal schooling, higher family income, and lower maternal depressive symptoms.

Regarding predictors for LCSs, negative predictors mean that higher levels of the predictor are associated with less change in the socioemotional outcome. In other words, negative predictors impeded an increase in socioemotional competences, in the case of ER and SE, and prevented a more internal orientation for LoC from developing from pre- to mid-pandemic. Considering sex as a predictor, we found that being female was a positive predictor of change in SE, meaning that female adolescents showed a greater increase in SE across the study period. Negative predictors of change for ER included higher maternal depressive symptoms during the pandemic, more frequent episodes of harsh parenting, and more family conflicts. Negative predictors of changes in SE included higher maternal depressive symptoms during the pandemic, more perceived impacts of the pandemic, family conflicts, and a negative perception of screentime during the pandemic. Maternal job loss during the pandemic was a positive predictor of change in SE. Finally, harsh parenting and family conflicts were positive predictors of LoC change, meaning that these variables hindered the change in LoC toward a more internal orientation during the study period (Table 3 and Table S3).

Discussion

Based on data from a prospective Brazilian birth cohort, we found that, on average, adolescents showed development of socioemotional competences from before to during the COVID-19 pandemic. However, during the pandemic, higher levels of harsh parenting, maternal depressive symptoms, and family conflicts were important factors associated with less positive development of socioemotional competences across the study period.

Previous research suggests variability in adolescents' functioning during the pandemic and heterogeneous effects across specific groups and measures.[23,24] Several studies reported an overall increase in adolescent psychological distress, peer problems, and decreases in prosocial behavior, overall well-being, and positive affect, especially in the first year of the pandemic.[4,24] On the other hand, there is a growing body of evidence showing that, for some adolescents, psychosocial functioning did not change substantially from before to during the pandemic.[25,26] In fact, many adolescents experienced positive adaptation and emotional growth during this period.[6,7] The average increase in youth socioemotional competences observed in the current cohort might be related to a number of factors. First, it may be explained by the normative developmental process expected in this life phase – the time gap between the pre- and the mid-pandemic assessments was approximately 20 months, which represents a relatively long period in adolescent life.[27] In addition, the mid-pandemic assessment occurred when vaccination against the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) had already started in Brazil, deaths and caseloads were decreasing, and schools had reopened in Pelotas.[28] It is possible that we would have had different results if follow-up had taken place earlier in the pandemic or multiple assessments had been conducted during this period. Third, our findings show a mean increase in the socioemotional indicators, which does not allow us to describe different patterns of change (e.g., as examined by Daniunaite et al.[29]). The identification of changes in specific groups is beyond the scope of the present study, but should be considered in future research.

A further factor relevant to the overall increases in socioemotional competences observed in this study is that the restrictions imposed by the pandemic (such as school closure and ''stay-at-home'' orders) may have reduced some stressors normally associated with

Table 3 Predictors of socioemotional competence scores at T_1 and of LCS from T_1 to T_2

	ER		SE		LoC	
	T1	LCS	T1	LCS	T1	LCS
Demographic and pre-pandemic predictors						
Maternal schooling (years)	0.044 (0.025)*	-0.009 (0.027)	0.041 (0.026)	0.005 (0.028)	-0.492 (0.027)***	0.012 (0.029)
Family income (quintiles)	0.088 (0.026)**	0.008 (0.027)	0.081 (0.026)**	-0.035 (0.028)	-0.103 (0.026)***	0.014 (0.029)
Marital statis: single	0.020 (0.022)	0.014 (0.024)	0.032 (0.021)	0.012 (0.025)	-0.012 (0.025)	0.018 (0.027)
Skin color: Black/brown	-0.025 (0.022)	0.019 (0.025)	0.032 (0.022)	-0.036 (0.024)	0.045 (0.023)*	0.002 (0.026)
Sex: Female	-0.217 (0.021)***	0.021 (0.024)	-0.243 (0.021)***	0.053 (0.024)**	-0.018 (0.022)	0.030 (0.024)
Maternal depressive symptoms at T1	-0.110 (0.022)***	0.036 (0.031)	-0.089 (0.023)***	-0.033 (0.032)	0.096 (0.022)**	-0.060 (0.032)*
Pandemic-related predictors						
Maternal depressive symptoms at T2	-	-0.094 (0.028)**	-	-0.086 (0.030)**	-	0.001 (0.028)
Beneficiary of pandemic-specific government cash transfer program†	-	-0.002 (0.023)	-	-0.007 (0.022)	-	-0.016 (0.021)
Maternal job loss	-	0.007 (0.021)	-	0.056 (0.021)**	-	0.013 (0.020)
Fear of food shortage	-	-0.040 (0.025)*	-	-0.021 (0.024)	-	0.044 (0.030)
Harsh parenting	-	-0.103 (0.023)***	-	-0.006 (0.022)	-	0.064 (0.021)**
More perceived impacts of the pandemic	-	-0.038 (0.023)*	-	-0.063 (0.022)**	-	-0.014 (0.022)
More social isolation	-	0.031 (0.022)	-	-0.037 (0.020)*	-	-0.003 (0.020)
Fear of getting sick	-	-0.011 (0.024)	-	0.019 (0.024)	-	0.038 (0.022)*
Family conflicts	-	-0.146 (0.024)***	-	-0.142 (0.023)***	-	0.081 (0.024)**
Negative perception of screentime	-	-0.031 (0.023)	-	-0.064 (0.022)**	-	0.006 (0.023)

Data presented as β (SE).
Standardized coefficients are shown.
ER = emotion regulation; LoC = locus of control; S.E. = standard error; SE = self-esteem; T_1 = pre-pandemic wave; T_2 = mid-pandemic wave.
* $p < 0.10$; ** $p < 0.05$; *** $p < 0.001$.
† Programa Auxílio Brasil.

diminished well-being of adolescents under normal circumstances. For example, fewer difficulties with peers in school, less exposure to bullying, less academic or social pressure, and increased online connection with friends might have been beneficial for SE in some.[2,9] Qualitative evidence on adolescents' perceptions of the pandemic showed that, despite reporting difficulties, many youths appreciated having more free time, developed coping strategies to maintain well-being, engaged in leisure activities to overcome the challenges of home confinement, and associated this period with personal growth and a greater sense of self-preservation.[30,31] As adolescence and young adulthood are periods of great and rapid change in social and emotional domains,[8,9] follow-up studies are needed to investigate if and to what extent the changes in the adolescents' perceptions and learnings during COVID-19 will endure and influence their long-term well-being and socioemotional development.

Other potential positive side-effects of the pandemic include that some adolescents may have experienced an improved relationship and communication with their parents as a result of more time spent within the family, contributing to developmental benefits.[30,31] On the other hand, home confinement and pandemic-related distress were associated with an increased risk of child maltreatment and harsh discipline, affecting adolescents' emotional development and well-being.[32] In fact, in the present study, family life during the pandemic had an important influence on adolescents' socioemotional adjustment, as family conflicts, poor maternal mental health, and harsh parenting were significant predictors of poorer socioemotional development. Having a negative perception of screen use also predicted a decrease in SE. This is consistent with a study in Ecuador which showed an adverse effect of higher screentime during the pandemic on SE.[33] Although use of digital technologies is ubiquitous in modern times, and, in particular, heightened even further during the pandemic, subjective evaluation of the benefits and harms of electronic devices and social media varied widely.[34,35] Understanding the factors associated with these differences can help inform adolescents on how to make more rational use of technology and regulate their screen time.[35]

The strengths of the current study include its longitudinal design, large sample size, and availability of pre- and mid-pandemic information to estimate changes in socioemotional competences during the COVID-19 pandemic. Moreover, our findings are based on data from a birth cohort from Brazil, adding to the literature evidence from an underrepresented population, i.e., from the global south.[36] However, some limitations should be considered. The analyzed sample included approximately 48% of the original cohort and even though we adjusted our analysis for confounding factors assessed at birth, we cannot rule out the possibility of residual bias. Indeed, the analyzed sample was composed of participants from a more advantaged socioeconomic background when compared to the original cohort. This possibly affected our results, although it is difficult to speculate in which direction, given the challenging situation imposed by the COVID-19 pandemic, the complex nature of the outcomes, and our nonintuitive findings (i.e., positive adolescent socioemotional development). As mentioned, the time gap between assessments of nearly 20 months is a relatively long period in an adolescent's life. Data from multiple time points would be more informative regarding patterns of change in the population, especially in a life phase of considerable turmoil, as is adolescence. The impacts of the COVID-19 pandemic were greatly heterogeneous within the Brazilian population and territory, because of the federal government's failure to mount a coordinated response and the misinformation-disinformation crisis.[37] Although we used a sample derived from a birth cohort, we cannot estimate the extent to which these differences affect the generalizability of our results at the national level. Unfortunately, several other relevant variables that could be associated with the outcomes of interest, such as trauma, community violence, and school factors, were lacking in our study due to time and resource restrictions. We encourage future researchers to examine the role of these factors on socioemotional development, which can provide a more comprehensive understanding of adolescent wellbeing during the pandemic.

To conclude, we found that adolescents' socioemotional competences developed positively during the pandemic. Family context and the relationship between family members had an essential role in predicting changes in adolescent socioemotional adjustment. Our findings contribute to the body of evidence regarding adolescent psychosocial development during the pandemic among participants of a Brazilian birth cohort. Research on adolescent wellbeing during the pandemic can contribute to the development of evidence-based interventions and guide future clinical practice in terms of prevention and treatment strategies. Moreover, this knowledge can inform public health initiatives and policies aimed at supporting adolescents' mental health in the post-pandemic world.

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Disclosure

The authors report no conflicts of interest.

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